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Jennifer D. Adamson

Date: May 21, 2003

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Patent  
TS-0968 (US)  
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— IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

|                            |   |                       |
|----------------------------|---|-----------------------|
| In re application of       | ) |                       |
|                            | ) |                       |
| BERNARDUS H. BOSMANS ET AL | ) |                       |
|                            | ) |                       |
| Serial No. 09/757,886      | ) | Group Art Unit 1724   |
|                            | ) |                       |
| Filed January 10, 2001     | ) | Examiner C. S. Bushey |
|                            | ) |                       |
| GAS-LIQUID CONTACTING TRAY | ) | May 21, 2003          |
|                            | ) |                       |

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**APPELLANT'S BRIEF**

The following brief is on appeal of a final rejection of claims 1-10 of the above-identified U.S. patent application. The final rejection was contained in an Office Action mailed on Oct. 24, 2002, and a Notice of Appeal was mailed by Applicant on January 23, 2003. This brief is filed in triplicate. Please charge the fee for filing of this brief to Shell Oil Company Deposit Account No. 19-1800. It is respectfully requested that the Board consider the following arguments and reverse the final rejection of claims 1-10 in the above-identified application. A petition for a two-month extension of time accompanies this Brief.

**REAL PARTY IN INTEREST**

The invention of the present application is assigned to Shell Oil Company, which is the real party of interest in the present appeal.

## RELATED APPEALS AND INTERFERENCES

Appellants, and appellants' legal representative, are not aware of any appeals or interferences that directly affect or could directly be affected by or have a bearing on the Board's decision in the present appeal.

## STATUS OF THE CLAIMS

Claims 1, 2, 7 and 8 stand finally rejected under 35 U.S.C. §102(b). Claims 3-6, 9 and 10 stand finally rejected under 35 U.S.C. §103(a). Rejection of Claims 1-10 is presently appealed.

## STATUS OF AMENDMENT

An Amendment is being filed simultaneously with this Appeal Brief to address the Examiner's Point 9 (second paragraph) in the Final Rejection with respect to the rejection of Claims 7 and 8 under 35 USC §102(b).

## SUMMARY OF THE INVENTION

The present invention relates to an improved gas-liquid contacting tray. The tray comprises a bubble area and one or more rectangular downcomers which are longer in length than in width, which downcomer comprises two sloped downcomer walls along its length, a downcomer opening at tray level and one or more downward directed liquid discharge openings at its lower end, which downcomers are so positioned on the tray that bubble area is present at both of its longer sides, wherein the cross-sectional area at the lower end of the downcomer is less than 40% of the cross-sectional area of the upper end of the downcomer at tray level.

## ISSUES

- 1) Does WO 99/12621 ('621) clearly anticipate Claims 7 and 8 under 35 U.S.C. §102(b)?
- 2) Does EP 0 092 262 A1 ('262) clearly anticipate Claims 1, 2, 7 and 8 under 35 U.S.C. §102(b)?
- 3) Does the '262 reference provide a *prima facie* basis for rejection of Claims 3-5 under 35 U.S.C. §103(a)?

- 4) Does the '262 reference in view of Jenkins US Patent 4,496,430 ('430) provide a *prima facie* basis for rejection of Claim 6 under 35 U.S.C. §103(a)?
- 5) Does the '621 reference or the '262 reference in view of either Sampath *et al* US Patent 5,230,839 ('839) or Yu *et al* US Patent 6,299,146 ('146) provide a *prima facie* basis for rejection of claims 9 and 10 under 35 U.S.C. §103(a)?

#### GROUPING OF CLAIMS

The claims stand or fall together.

#### ARGUMENTS

##### 1) Rejection of Claims 7 and 8 over the '621 Reference

For a prior art reference to anticipate a set of claims, each and every limitation of the claims must be disclosed in that reference. *Glaxo v. Novopharm*, 34 USPQ2d 1565 (Fed. Cir. 1995). An Amendment under 37 CFR 1.116 has been filed with this Appeal Brief amending Claim 7 such that it corresponds to the amendments made to Claim 1 in Applicant's response filed Sept. 16, 2002. Such amendments were intended to have been made at the time. In view of this Amendment, Applicants respectfully request that the rejection be reversed.

##### 2) Rejection of Claims 1, 2, 7 and 8 over the '262 Reference

Claims 1, 2, 7 and 8 were rejected under 35 USC §102(b) as being anticipated by WO EP 0 092 262 A1 ('262), and, in particular, Figures 1 and 2. This rejection is respectfully traversed. For a prior art reference to anticipate a set of claims, each and every limitation of the claims must be disclosed in that reference. *Glaxo v. Novopharm*, 34 USPQ2d 1565 (Fed. Cir. 1995). The '262 reference is not directed toward the shape of the downcomers, the description is silent as to the dimensions and it does not disclose the quantitative shape of the downcomers. In the specification of the '262 reference, the downcomers are described as having "inclined side walls" and as having "a configuration resembling a frustum in cross-section" (page 5, first paragraph). However, there is no mention of specific dimensions. Without specific dimensions, one skilled in the art would assume that a typical downcomer would be used to practice the invention. As described in the instant application on page 1, lines 21-25, the typical downcomer has a ratio between the lower end and the upper end of

around 50%, which is significantly different than the claimed "less than 40%". This typical ratio is illustrated in the enclosed excerpt from the Kister textbook "Distillation Operation" on pages 173-175. The Examiner asserts that Applicants have cited a "self-serving" reference. However, as can be observed from a quick Internet search on his name, Henry Z. Kister is a well known and well respected figure in the field of distillation and his texts are commonly used as guides and teaching aids. Further more, Kister arrived at his figures for typical sloped downcomers from various references, only one of which he authored. Therefore, the Kister text is an objective reference point. The '262 does not disclose a ratio between the lower and upper ends of the downcomer of less than 40% and therefore does not anticipate the instant claims. In view of these remarks, Applicants respectfully request that the rejection be reversed.

### 3) Rejection of Claims 3-5 over the '262 Reference

To establish a *prima facie* basis for obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination must be found in the prior art, and not based on applicant's disclosure [MPEP § 2142; *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).]

As discussed above, the '262 reference does not disclose any specific ratio between the lower and upper ends of the downcomers. In particular, the figures of the references cannot be deemed to disclose a ratio of 33%, as there is no indication in the specification that such figures are drawn to scale. As explained in the MPEP §2125, the "proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale." However, "the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art." As discussed above, one of ordinary skill in the art would assume a typical ratio of around 50%. As discussed in the specification of the instant application, the problem to be solved with the instant invention is downcomer backup and choking limitations. It would seem to be counter-intuitive to solve this problem by reducing the volume of the downcomer by further sloping of the walls, therefore, Applicants believe that such a solution is not taught nor suggested in

the '262 reference and would not be an obvious modification to one skilled in the art seeking to reduce downcomer choking. Therefore, there is no suggestion or motivation to modify the reference to arrive at Applicants' current invention. Because this is lacking, a *prima facie* case for obviousness has not been established. In view of these remarks, Applicants respectfully request that the rejection be reversed.

4) Rejection of Claim 6 over the '262 Reference in view of the '430 Reference

As explained above, the '262 reference does not teach or suggest the elements of Claim 1 from which Claim 6 depends. The '430 reference does not supply the missing elements. There is no teaching or suggestion in the '262 reference to modify it according to the '430 reference in order to arrive at the instant invention. Therefore, the references do not render Claim 6 obvious. In view of the above remarks, Applicants respectfully request that the rejection be reversed.

5) Rejection of Claims 9 and 10 over either '621 or the '262 Reference in view of either the '839 Reference or the '146 Reference

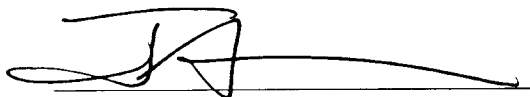
With respect to the '621 reference, an Amendment under 37 CFR 1.116 has been filed with this Appeal Brief amending Claim 7 such that it corresponds to the amendments made to Claim 1 in Applicant's response filed Sept. 16, 2002. Additionally, as argued above, the '262 reference does not teach or suggest the elements of Claim 1 from which Claim 6 depends. As there is no teaching nor suggestion to combine these references, a *prima facie* case for obviousness has not been made. In view of these arguments, Applicants respectfully request that the rejection be reversed.

CONCLUSION

For the reasons set forth above, Applicants assert that the rejections made by the Examiner are improper. Applicants therefore respectfully request that the Board reverse the Examiner's rejections.

Respectfully submitted,

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## APPENDIX

### CLAIMS ON APPEAL ARE 1-10:

1. A gas-liquid contacting tray comprising:  
a bubble area; and,  
one or more rectangular downcomers sharing at least two boundaries with the bubble area, each having a length and a width wherein the length is longer than the width, and an upper and lower end, comprising:  
two sloped downcomer walls along the length;  
— a downcomer opening at tray level; and,  
one or more downward directed liquid discharge openings at its lower end;  
wherein the downcomers are so positioned on the tray that the bubble area is present along the length, wherein the cross-sectional area at the lower end of the downcomer is less than about 40% of the cross-sectional area of the upper end of the downcomer at tray level.
2. The tray of claim 1, in which the cross-sectional area at the lower end of the downcomer is between about 5 and 40% of the cross-sectional area of the upper end of the downcomer at tray level.
3. The tray of claim 2, in which the cross-sectional area at the lower end of the downcomer is between about 10 and 30% of the cross-sectional area of the upper end of the downcomer at tray level.
4. The tray of claim 1, in which the lower liquid discharge opening is formed by the elongated opening between the longitudinal lower ends of the downcomer walls.
5. The tray of claim 1, in which the rectangular downcomers are positioned parallel relative towards each other, wherein each downcomer extends from one point on the circumferential to the opposite point on the circumferential of the tray.
6. The tray of claim 1, in which the tray is divided in two tray sections by a diametrical line, each tray section provided with a row of rectangular downcomers, the downcomers arranged perpendicular to the diametrical line such that the ends of the downcomers of each tray section meet this line in an alternating fashion.
7. A column comprising a plurality of axially spaced trays with a distance of a tray space between the trays, each tray comprising:  
a bubble area; and,

one or more rectangular downcomers sharing at least one boundary with the bubble area, each having a length and a width wherein the length is longer than the width, and an upper and lower end, comprising:

two sloped downcomer walls along the length;

a downcomer opening at tray level; and,

one or more downward directed liquid discharge openings at its lower end;

wherein the downcomers are so positioned on the tray that bubble area is present along the length, wherein the cross-sectional area at the lower end of the downcomer is less than 40% of the cross-sectional area of the upper end of the downcomer at tray level.

8. The column of claim 7, in which the downcomer extends between about 50 and 90% of the tray spacing below a tray.

9. The column of claim 8, in which an inlet weir is present along a boundary of an area just below the liquid discharge openings of a tray and the corresponding bubble area.

10. The column of claim 9 in which the column comprises a distillation column or an absorption column.